

 Road Surface Management and Pavement Management Systems

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#### What is it?

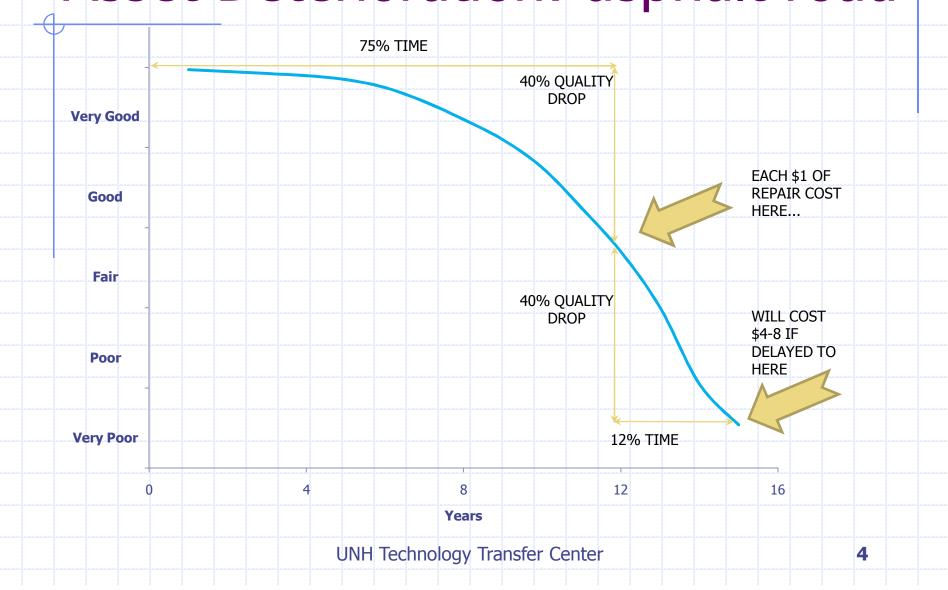
- Asset inventory and assessment of current road infrastructure.
  - What assets are involved
    - All Town Roads
      - Paved
      - Unpaved
  - Road Signs
  - Drainage
    - Culverts Catchbasins

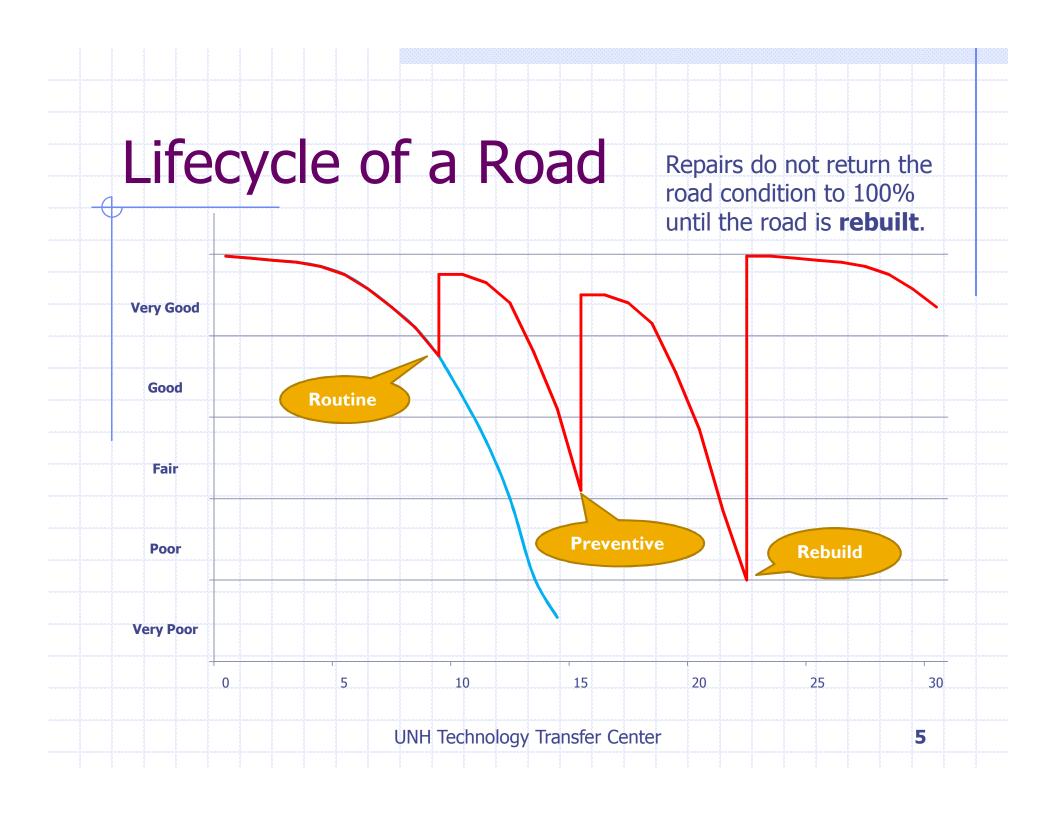
10/14/09

### Why manage assets?

- Budget efficiency target funds where they are needed
  - Routine and preventive maintenance is less expensive than replacement / rebuilds
- A management plan can reduce liability
- Management efficiency coordinate projects to reduce costs and headaches
- Recordkeeping

### Asset Deterioration: asphalt road





### **Asset Management Phases**

- You need to know:
  - Who is responsible for maintenance?
  - What do you maintain?
  - Where is it?
  - What condition it is in?
  - When to maintain it?
  - How to maintain it?
  - How much does it cost to maintain?

Inventory

Condition Rating

Management

#### **Process**

- Inventory
- Condition
  Rating
- Management
  Plan
- Update

- → Generate list(s), compile data, verify in the field
- → Travel to each asset, collect and enter condition data
- → Make decisions based on budget, schedule, priorities
- → Update inventory, work history, conditions, then review and revise plans

### **Condition Ratings**

- A simple system is easy and adequate for most asset ratings:
  - 3 or 5 point ratings (low / med / high)
  - Severity and extent (how bad, how much)
  - Maintenance driven choices
     (replace, repair, bent sign post, clean ditches)
  - Objective define each rating for consistency and repeatability

### **Asphalt Distress Rating Summary**

- Severity Low Med High
- Alligator Cracks
  - 1/16" 1/8" 1/8"+
- Long / Transverse Cracks
  - <1/8" <1/4" 1/4"+
- Edge Cracks
  - <1/8" less than 12" from edge</p>
  - <1/4" less than 24" from edge</p>
  - 1/4"+ more than 24" from edge, breakup of surface

- Extent Low Med High
- All Cracks but Transverse
  - <10% 10-30% 30%+</p>
- Transverse Cracks
  - 50ft 25-50ft <25ft spacing</li>
- Patching
  - **•** <10% 10-30% 30%+
- Potholes
  - <5-5-10-10+ per 100ft
- Roughness
  - best guess / use photos

### Management Plans

- Simple: list the items that need work and the work needed.
  - Apply 2" asphalt overlay to Maple Way
- Complicated: For \$250K, which roads can I repair to have the greatest improvement in my network PCI?
- Need for iteration / what-if scenarios
- **◆ PERFORMANCE** feedback

10/14/09

### Management Plans - Roads

- ♦ To consider:
  - Apply best technical and management practices
  - Roads that are not repaired will continue to deteriorate
  - 'Keep good roads good' or 'Best First'
  - Routine maintenance gives the most bang for the buck
  - Bad roads will remain bad
  - You <u>cannot</u> predict needed repairs than 5 years in advance
  - You <u>can</u> budget for repair *level* 5-20 years
  - Roughly, you want to apply no more than 2 preventive repairs (crack seals, surface coat) before a rehab/rebuild is due

#### Road Surfaces

- An easy to understand and use, distress driven, road surface management tool
  - Determine the key distress, then list repairs that fix that problem
  - Use the analysis tools to generate a 10 year management plan and budget
  - Flexible: use locally and historically effective repairs for paved and unpaved roads
- ◆ The 3<sup>rd</sup> generation program (since 1988)
- About 5000 users worldwide (in 2000)

12

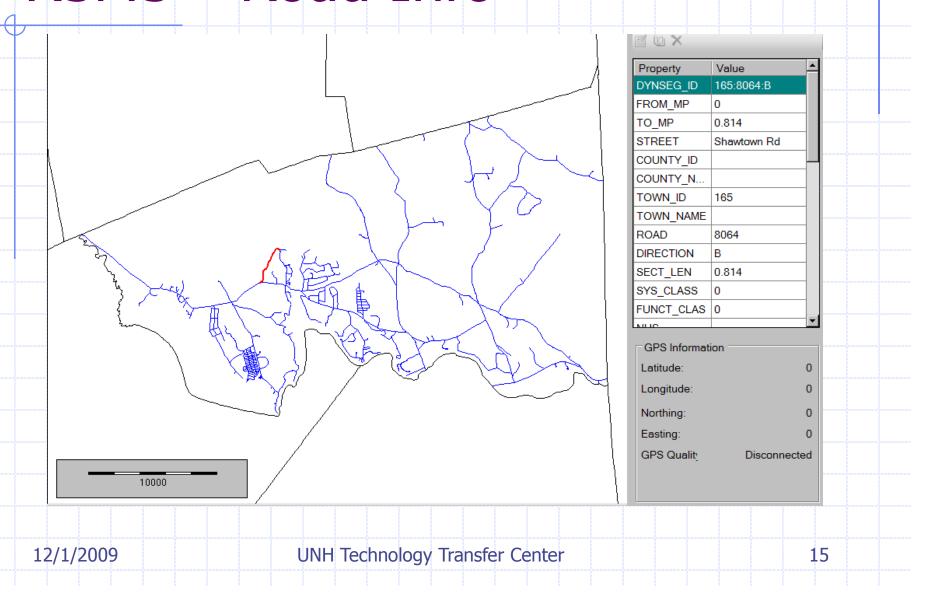
# RSMS – Some Examples

inventory RSMS 111  ✓ ★ ▶ ▶ I III 0 III	<b>性多十多</b> 2	_ □ → ② □ □ Index VALUE				
ROAD NAME	SURFACE RIN	FROM ST	TO ST	TRAFFIC		
Stoddard Lane	Asphalt	Chick Road	Cul de sac	Low		
Sherwood Forest Way II	Asphalt	Pavement change	West Bay Road	Low		
Fife and Drum Way	Asphalt	Independence Drive	East Danforth	Low-Medium		
Hampshire Road	Asphalt	Ossipee Lake Road	York Lane	Low-Medium		
_ittle Knoll Circle	Asphalt	Indenpendence Driv	Cul de sac	Low-Medium		
Marina Road	Asphalt	Ossipee lake Road	Dead-end	Low-Medium		
Old Yankee Drive	Asphalt	Bennett Road	York Lane	Low-Medium		
Powder Horn Lane	Asphalt	Liberty Lane	Cul de sac	Low-Medium		
ork Lane	Asphalt	Ossipee Lake Road	Old Yankee Road	Low-Medium		
laverhill Road	Unpaved	Pequawket Trail	Dead-end	Low-Medium		
Watson Hill Road II	Asphalt	Burnham	Unpaved	Low-Medium		
Vatson Hill Road IV	Asphalt	Unpaved	Dead-end	Low-Medium		
luntress Bridge Road	Asphalt	T/L	Route 25	Low-Medium		
ndependence Drive	Asphalt	East Danforth	Liberty Lane	Low-Medium		
Patriots Way	Asphalt	Bennett Road	Liberty Lane	Low-Medium		
Vest Bay Road	Asphalt	Ossipee Lake Road	Pavement Change	Low-Medium		
West Bay Road II	Unpaved	Pavement Change	Chick Road	Low-Medium		
luckins Road II	Asphalt	Pavement Change	Pequawket Trail	Low-Medium		
oung Hill Road II	Asphalt	Unpaved	Moulton Road	Low-Medium		
Pequawket Trail	Asphalt	Ossipee Lake Road	Unpaved	Low-Medium		
Old Stage Coach Road	Asphalt	Ossipee Lake Road	Private	Low-Medium		

## RSMS – Some Examples

	RSMS - UPDATE IN	IVENTORY #RSMS110	Inde	exed By - PRIORITY	Z EDIT	K]
	ROAD NAME	Stoddard Lane		RIN		
	SEQ NUM	0		ROAD SEC		
	FROM ST	Chick Road		MAINT DIV		
	TO ST	Cul de sac		JURISDICT	M - My Town	
	NO. LANES	0		CLASS		
	WIDTH	22.0 SHOULDER	WIDTH 0.0	TRAFFIC	1 - Low	
	SURFACE	2 - Asphalt		IMPORT.	1 - Low	_
	SHOULDER	0 - None		US/METRIC	us 🔽	
	MILE POST	0.000		TEXT1		
	END POST	0.273		INV YEAR	2006	
	LENGTH	0.273		CUR YEAR	2006	
	COMMENTS				A	
		1				  -  -
	<u>S</u> ave	<u>C</u> ancel <u>H</u> elp	<u>P</u> rev	<u>N</u> ext See	<u>k</u> De <u>l</u> ete	·
1	12/1/2009	UNH Ted	chnology Transfer	Center	1	4

### RSMS - Road Info



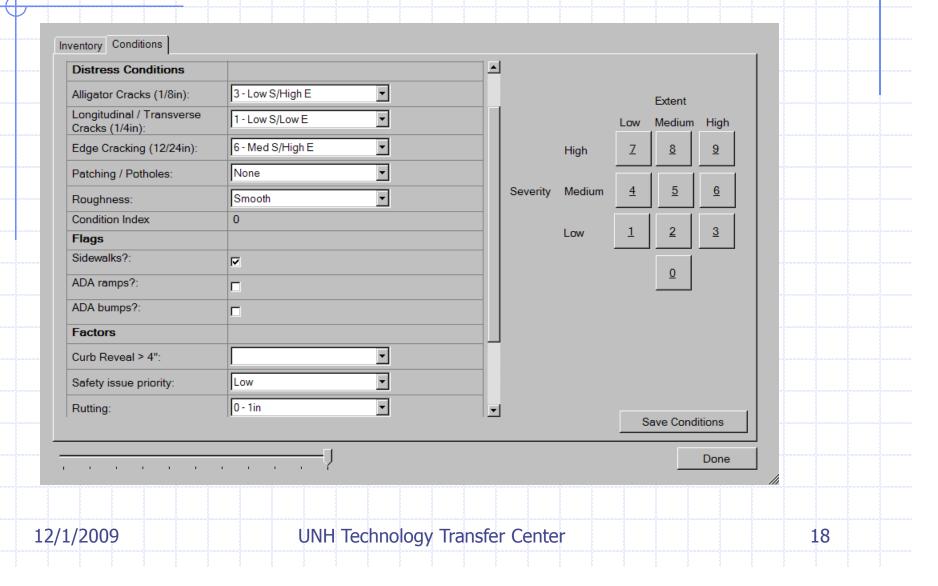
# RSMS – Inventory

SNAME:	Shawtown Rd		poeter de de responsación
RI_NO:			
RSECTION:			***********
DIVISION:			
MAINTJURIS:	Town		
US_METRIC:	US 🔻		
FROMSTREET:	Main St		
TOSTREET:	Elm St		
MILEPOST:	0.084		
ENDPOST:	1.814		
LENGTH:	0.730		***************************************
ROAD_WIDTH:	25		***********
SURF_TYPE:	Asphalt		
SHLD_TYPE:	Gravel		
	'	Save In	ventory
1 1 1	<del></del> Ţ		Done

## Road Condition – Old version

Summary of Res Survey Results AL Road Name/RIN	sults From Road Condition Surveys - Date:   L Road Types For Dates Between: 01/01/2005   Distress   Severi	01/07/2008 5 - 01/07/2008 ty / Extent
Abenaki Drive - End of Section, Length	Unpv, Rutting 0-9 Unpv, Loose Aggr 0-9 Unpv, Corrugat 0-9 Unpv, Potholes 0-9 Unpv, Cross Sect 1-3 Unpv, Drainage 1-3 Unpv, Dust Contr 1-3	None None None Low/Med Low/Low Low/Low None
PCI for this Section - This Unpaved Road's PC	· 95 I Value = 95 Hard Section Length = 0.212	
Babcock Road -	Unpv, Rutting 0-9 Unpv, Loose Aggr 0-9 Unpv, Corrugat 0-9 Unpv, Potholes 0-9 Unpv, Cross Sect 1-3 Unpv, Drainage 1-3 Unpv, Dust Contr 1-3	None None Low/Low None Low/Low Low/Low None
End of Section, Length PCI for this Section - This Unpaved Road's PC	n - 0.368	iara ***********************************
Bennett Road  - End of Section, Length PCI for this Section -	Asph, Allig Crck 0-9 Asph,Lng/Tran Cr 0-9 Asph, Edge Crck 0-9 Asph, Patch/Pot 0-3 Asph, Roughness 1-3 Asph, Rutting 1-3 Asph, Drainage 1-3	None None None Low/Low Low/Low Low/Low
This Asphalt Road's PC	· 100 I Value = 100 Hard Section Length = 1.547	
1/2009	UNH Technology Transfer Center	17

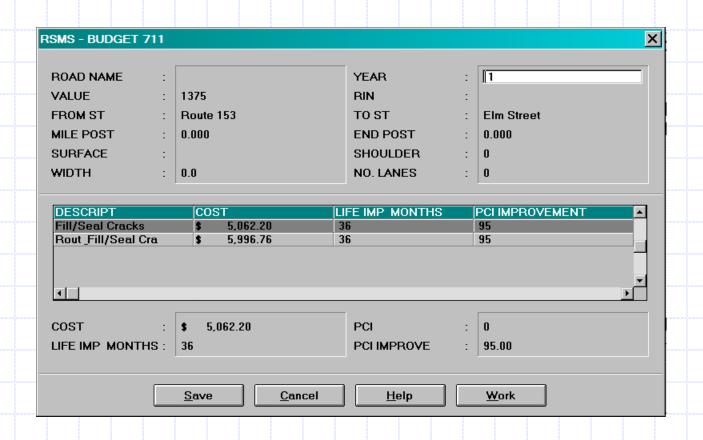
## RSMS – Surveys

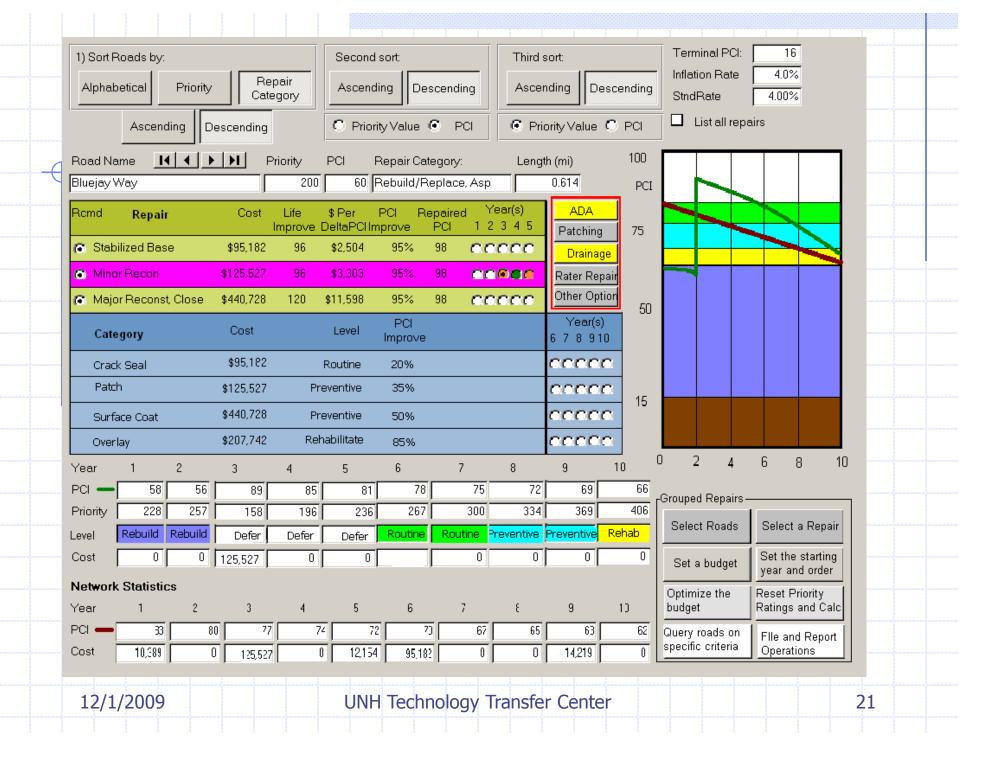


## Repairs – Old RSMS

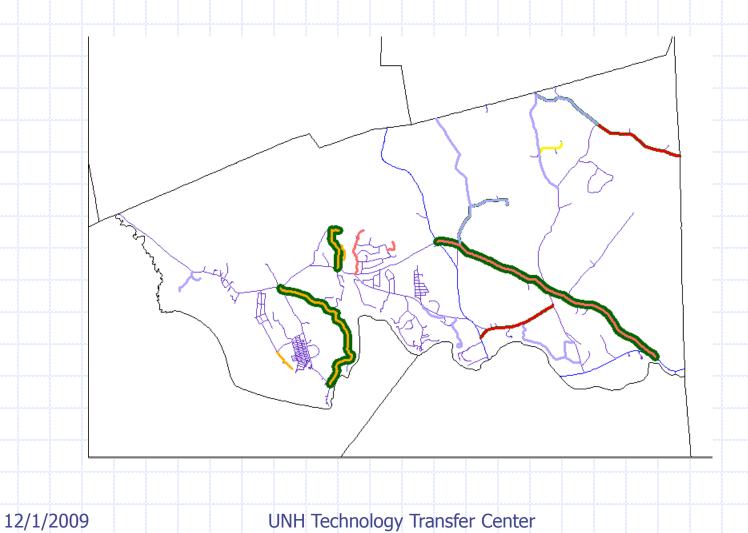
RIN		Div	Width	Start	Length	Desc	ription
Abenaki	Drive			Patch/Sp	ot Material,		
	_ 		14.0	0.000	0.212		0 00
	Months Months		Defer Maintenance Spot Regravel	<b>:</b>		\$	0.00 4,701.31
		Added	Spot Regravel, Ca	rc12		\$	6,111.71
	MOHEND	naaca	bpoc Regiavei, ed	1012		~	0,111.71
Babcock	Road			Reshape	Minor Mat.,		
_	<i>-</i>		16.0	0.000	0.368		
	Months		Defer Maintenance			Ş	0.00
24	Months Months	Added	Reshape, Add Mind Reshape-Blade/Dra	or M		ş	621.77 483.60
	MOIICIIS	Added	Kesnape-Blade/Dla	ı <u>y</u>		<del>-</del> -	403.00
Bennett	Road			Satisfac	tory, Asphal 1.547		
	_		24.0		1.54 <i>†</i>		
	Months		Defer Maintenance			\$	0.00
12	Months	Added	Repair Only Hi Se	ever		\$	32,237.00
Berry Ba	boog ve			Rechane	Minor Mat.,		
berry bo	- Koda		14.0	0.000	0.373		
0	Months	Added	Defer Maintenance		0.07.0	Ś	0.00
24	Months	Added	Reshape, Add Mind	r M		\$ \$ \$	551.44
24	Months	Added	<u>Reshape-Blade/Dra</u>	ıg		\$	428.90
Burnham	Poad			Dochano	Minor Mat.,		
burimanı	Koau		16.0	0.000	1.741		
n	Months	Added	Defer Maintenance		<b>エ・/ モエ</b>	\$	0.00
	Months		Reshape, Add Mind			\$	2,941.59
	Months		Reshape-Blade/Dra	ıσ		Ė	2,287.91

# Budgeting – Old RSMS









## Moultonborough's PCI?

◆PCI = Pavement Condition Index

- ◆2009 condition ratings
  - Before 2009 road projects, 75 out of 100.
  - After 2009 road projects, 76 out of 100.

12/1/2009

#### Where do we want to be?

- Using the road priority index which consists of reconstructs and preventative repairs.
- How many dollars are needed to maintain current PCI.
- Remember \$'s go further with preventative repairs to good roads.

12/1/2009

### How the values add up

- \$ no dollars= PCI points reduce 3pts yrly
- ♦ \$320K annual = PCI point reduction 1 pt.
- ♦ \$600K annual = PCI points increase by 2 points.
- Maintaining \$600-650K annually over a 5-10 yr period will increase PCI slightly, or maintain it at current levels.

12/1/2009